Release in Fell

EAST POPLAR UNIT WELL NO. 55

ROOSEVELT COUNTY, MONTANA

MURPHY EXPLORATION & PRODUCTION CO., OPERATOR

FILE Copy

EAST POPLAR UNIT WELL NO. 55

ROOSEVELT COUNTY, MONTANA

MURPHY CORPORATION--OPERATOR

WELL HISTORY

WELL NO.:	East Poplar Unit No. 55
LOCATION:	C NW SW OF Section 23, Township 28 North, Range 51 East
ELEVATION:	2218' Ground - 2230' K.B.
CONTRACTOR:	Zach Brooks Drilling Company
SPUDDED:	9:00 P.M., May 13, 1955
COMPLETED:	6:00 A.M., June 14, 1955
TOTAL DEPTH:	5937' Driller equals 5933' Schlumberger
CASING:	9-5/8" @ 1056.11' with 400 sacks cement 5-1/2" @ 5932.50' with 300 sacks cement
TUBING:	2-3/8" @ ~~5872.30'~~ 5925'
PERFORATIONS:	"C" Zone 5920'-5927.5'
PACKER:	Howco Type "C" Production Packer
ACID TREATMENT:	"C" Zone - 500 gallons Howco M.C.A. "C" Zone - 250 gallons regular acid
INITIAL POTENTIAL:	Flowed on 1/4" choke at rate of 206 BFPD, 5% water cut, TFP--150#, CFP--175#, CSIP--875#, TSIP--850#.
TYPE COMPLETION:	Single producer from the "C" Zone

206 / 10 30

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

East Poplar Unit H Battery and Wells EPU Nos. 22, 32, 55, 101, & 104

The East Poplar Unit H Battery and the wells producing into the battery, EPU Nos. 22, 32, 55, 101, & 104, are onshore production facilities located in Roosevelt County, Montana, in the East Poplar Unit Oil Field. The field is about 6 miles Northeast of Poplar, Montana, in Townships 28 and 29 North and Ranges 50 and 51 East.

The operator of the East Poplar Unit H Lease is Murphy Oil Corporation located at P. O. Box 547, Poplar, Montana 59255. The corporate headquarters are at 200 Jefferson Avenue, El Dorado, Arkansas, 71730.

The battery consists of a 8' x 27' vertical separator, a circulating pump with appropriate lines, and two 300 barrel steel welded tanks. The tanks are vented to the atmosphere and have unrestricted 4" overflow lines between tanks. An earthen pit of about 8,000 barrels capacity is located at the tank battery into which the separator or tanks may be emptied if needed for fluid storage.

All five wells flow and do not need well cellars or overflow pits.

The field flow lines and the well casing of each well are cathodically protected. The equipment is in excellent operating condition and there is no reasonable likelihood of a discharge or spill event.

The facilities are about 3.0 miles from Poplar River. The terrain dips gently West. The soil is sandy and the fields are under cultivation. Because of the distance to the river, the type of soil, and the terrain the 8,000 barrel pit at the tank battery is sufficient secondary containment for these facilities.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

East Poplar Unit H Battery and Wells EPU Nos. 22, 32, 55, 101, & 104

The East Poplar Unit H Battery and the wells producing into the battery, EPU 22, 32, 55, 101, & 104, are onshore production facilities located in Roosevelt County, Montana, in the East Poplar Unit Oil Field. The battery consists of a 8' x 27' vertical separator, a circulating pump with appropriate lines, and two 300 barrel welded steel tanks. An earthen pit of about 8,000 barrel capacity is located at the tank battery into which the separator or tanks may be emptied if needed for fluid storage.

The field is about 6 miles Northeast of Poplar, Montana, in Townships 28 and 29 North and Ranges 50 and 51 East.

The operator of the East Poplar Unit H Lease is Murphy Oil Corporation located at P.O. Box 547, Poplar, Montana 59255. The corporation headquarters are at 200 Jefferson Avenue, El Dorado, Arkansas 71730.

The foreman, Mr. Gerald Hagadone, is responsible for oil spill prevention at this facility. On each trip to the lease the pumper makes a visual inspection of all facilities and reports any malfunction to the foreman, Mr. Gerald Hagadone, and notes this malfunction on the ten day gauge report. There has been no reportable oil Spill Event during the twelve months prior to January 10, 1974.

The equipment is in excellent operating condition and there is no reasonable likelihood of a discharge or spill event.

The field flow lines and well casing of each well are cathodically protected.

Personnel are properly instructed in the operation and maintenance of equipment to prevent oil discharges, and applicable pollution control laws, rules and regulations. Each employee is given these instructions by the field foreman when they are employed. Scheduled prevention briefings for the operating personnel are conducted frequently enough to assure adequate understanding of the SPCC Plan. The procedures are reviewed every six months by the field foreman with each employee. When changes occur in procedures, each employee is informed.

Fluid in the 8,000 barrel storage pit is pumped to the salt water disposal unit if the water is brackish as determined by chloride tests. If only fresh water is contained in the pit it is disposed of by placing on lease roads to control dust and compact the roads. Any oil in the pit is pumped back through the separator with the water being sent to the disposal well. Oil skims are burned by state permits. There are no outlets from the storage pit and all fluids must be pumped out.

The two 300 barrel tanks are steel and are welded construction. The tanks are vented to the atmosphere and have unrestricted 4" overflow lines between tanks.

All five wells flow and do not need well cellars or overflow pits.

The facilities are about 3.0 miles from the Poplar River. The terrain dips gently West. The soil is sandy and the fields are under cultivation. Because of the distance to the river, the type of soil, and the terrain the 8,000 barrel pit at the tank battery is sufficient secondary containment for these facilities.

The tanks are observed daily by the pumper. Periodically, the foreman checks the entire tank battery and producing wells closely. If any trouble is suspected, the facility is shut down, the tanks and/or separator are emptied and cleaned. The facility is then thoroughly inspected by service company personnel, repairs are made if needed and the unit is placed back into service.

Produced salt water is pumped to a field gathering system for injection into a salt water disposal well. The above ground facilities are observed daily by the pumper and inspected by the foreman closely on his visits to the lease.

All salt water disposal flowlines are cement asbestos lines. These lines are buried and the surface is observed daily by the pumper.

MANAGEMENT APPROVAL

This SPCC Plan will be implemented as herein described.

Signature _____

Name _____

Title _____

CERTIFICATION

I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR, Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

_____
Printed Name Of Registered Professional Engineer

(Seal)

_____
Signature Of Registered Professional Engineer

Date _____

Registration No. _____ State _____

Contingency Plans For An Oil Discharge

East Poplar Unit H Battery and Wells EPU Nos. 22, 32, 55, 101, & 104

The field is visited twice daily by the pumper. Visual inspection is made on each facility on each visit to determine if any malfunction is occuring. The most likely potential oil discharges are checked thoroughly. Periodically, the field foreman, Mr. Gerald Hagadone, will conduct a close check of the entire facility.

The pumpers, Mr. Ferdinand Charette and Mr. Robert Atkinson, have been instructed in the operations and maintenance of equipment to prevent oil and water discharges and informed of the applicable pollution control laws, rules and regulations. If an oil discharge occurs, the pumper will immediately close the proper valves and/or shut down the production facility to stop the discharge. He will then call Mr. Gerald Hagadone who will in turn inform Mr. Bill Brown, District Superintendent. If needed, the proper state and federal agencies will be notified by Mr. Brown. The discharged oil will be reclaimed or disposed of by approved engineering procedures and in accordance to law.

In the event discharged oil collects on standing water such as a stock pond or rain water standing in a low spot, the oil will be pumped into a tank truck. The skim of oil left on the water will be removed by an oil skimmer owned by Murphy Oil Corporation. The skimmer can be towed to the field within an hours time.

If the discharge is in excess of 50 barrels of oil, the Montana Department of Health and Environmental Sciences in Helena will be notified by Mr. Brown.

If a Spill Event occurs as defined by federal law, the Environmental Protection Agency in Denver, Colorado will be notified by Mr. Brown.

Telephone numbers and personnel to be notified in case of an oil discharge are as follows:

Phone Numbers as listed on other copies will be included on final copy.

A.F.E. No. 55-444

AUTHORITY FOR EXPENDITURE
MURPHY CORPORATION - EAST POPLAR UNIT No. 55
NW SW Section 23, T28N, R51E, Roosevelt County, Montana

WELL DRILLING & CONSTRUCTION EXPENSE:	TO CSG. PT.	COMP. & EQUIP.	TOTAL COST
Drilling - Footage - 5950' @ $5.25/ft.	$ 31,240		$ 31,240
Daywork - 5 days @ $850/day &	4,250		4,250
2 days @ $775/day		$ 1,550	1,550
Loc. survey, permit & prep.	500		500
Roads, fences, cattleguard, etc.	500	2,000	2,500
Mud mat. & chem., incl. oil & gas	4,000		4,000
Drilling bits, baskets, etc.		250	250
Cementing casing	1,600	950	2,550
Coring materials & services	1,500		1,500
Testing services incl. swabbing	1,500		1,500
Other logs, surveys & analysis	1,200		1,200
Perforating services		600	600
Hydrafrac, acidize, etc. incl. oil		1,400	1,400
Float equip., centralizers, etc.	240	650	890
Trucking, welding & other labor	500	500	1,000
Supervision & Miscellaneous	500	500	1,000
Total Est. Well Drlg. & Const. Exp.	$ 47,530	$ 8,400	$ 55,930
WELL EQUIPMENT COSTS:			
Casing: 1000' of 9-5/8" O.D.	$ 3,500		$ 3,500
Casing: 6000' of 5-1/2" O.D.		$ 9,425	9,425
Tubing: 6000' of 2-3/8" O.D.		3,450	3,450
Xmas tree and connections	300	1,300	1,600
Total Est. Well Equip. Costs	$ 3,800	$ 14,175	$ 17,975
Total Est. Cost of Well	$ 51,330	$ 22,575	$ 73,905
LEASE EQUIPMENT:			
Flow lines		$ 4,000	$ 4,000
Other line pipe, valves & fittings		500	500
Trucking, welding, and other labor		2,000	2,000
Total Est. Cost of Lease Equip.		$ 6,500	$ 6,500
TOTAL EST. COST OF WELL & LEASE EQUIP.	$ 51,330	$ 29,075	$ 80,405

APPORTIONMENT OF TOTAL ESTIMATED COSTS

	%			
Murphy Corporation - Unit Operator	31.448470	$ 16,142	$ 9,144	$ 25,286
Hunoco Company	2.095565	1,076	610	1,686
Placid Oil Company	33.545035	17,219	9,753	26,972
The Carter Oil Company	16.335860	8,385	4,750	13,135
Phillips Petroleum Company	16.335860	8,385	4,750	13,135
C. F. Lundgren	.238210	122	69	191

APPROVAL OF EXPENDITURE

Production Department

Requested by Harold McLain
(Division Production Sup't.)
Date 5-3-55

Approved by Gordon Kirby
(Division Manager)
Date 5-5-55

Recommended by /s/ W. J. Thornton
(Gen'l Prod. Supt.)
Date 5-18-55

Approved

BUDGET SECTION

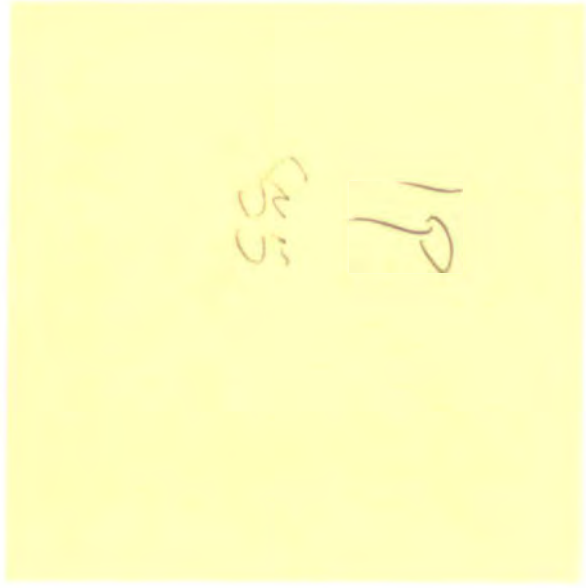
By /s/ Harold Robirds
(Budget Supervisor)
Date 5-18-55

APPROVED:

/s/ Paul C. McDonald 5-17-55
Vice President-Operations Date

CONFORMED COPY

EB:eg
5-4-55



Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 233, I

(SUBMIT IN TRIPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

NOTICE!
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE COMMISSION.

RECEIVED
MAY 27 1955
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA - BILLINGS

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Casing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	X
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

May 23, 19 55

Following is a { notice of intention to do work / report of work done } on land { owned / leased } described as follows:

LEASE BIM-A-012245 (E.P.U.)

MONTANA (State) Roosevelt (County) East Poplar (Field)

Well No. 55 NW SW Section 23 (m. sec.) 28N (Township) 51E (Range) M.P.M. (Meridian)

The well is located 1980 ft. { ~~N.~~ } of South line and 660 ft. { E. / ~~W.~~ } of West line of Sec. 23

The elevation of the derrick floor above the sea level is 2230' K.B.

READ CAREFULLY — DETAILS OF PLAN OF WORK — READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing).

DETAILS OF WORK
RESULT

Spudded at 9:00 P.M. 5-13-55. Ran 33 jts. 1046.86' of 9-5/8" #36, J-55, R-2, 8rd. thd. American Casing. Landed 11.25' below RKB and set at 1058.11'. Cemented with 400 sacks of regular cement with 2 percent $CaCl_2$. Plug down at 12:40 A.M. 5-15-55. Bumped plug with 1000#. Released pressure. Float held OK. Circulated approximately 50 sacks of clean cement.

APPROVED USGS 5-31-55

APPROVED SUBJECT TO LETTER DATED ON REVERSE.

Approved 6-1-55 (Date)

Mark P. Hunter

Title

District Office Agent

Company MURPHY CORPORATION

By Harold Milam

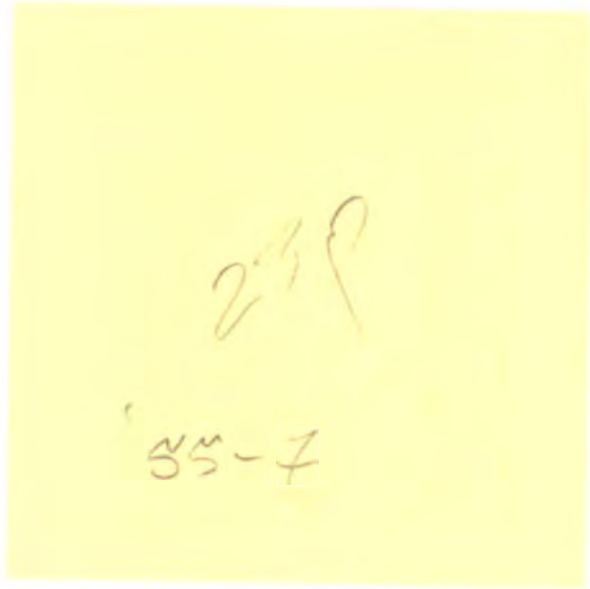
Title Division Production Superintendent

Address B-13 Behner Bldg., Billings, Mont.

NOTE:—Reports on this Form to be submitted to the District Agent for Approval in Triplicate.

3

OVER


218
'85-7

MURPHY 55

812

LOCATE WELL CORRECTLY

Form No. 4
(Gen. Rule 206.3 & 231)

RECEIVED
JUL
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA

(SUBMIT IN TRIPLICATE)
TO
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

LOG OF WELL

RECEIVED
JUN 30 1955
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA - BILLINGS

Company MURPHY CORPORATION Lease E.P.U. (BLM-A 012245) Well No. 55

Address B-13 Behner Bldg, Billings, Montana Field (or Area) East Poplar Unit

The well is located 1980 ft. from ~~(N)~~ (S) line and 660 ft. from ~~(E)~~ (W) line of Sec. 23

Sec. 23 ; T. 28N ; R. 51E ; County Roosevelt ; Elevation 2230' K.B.
(D.F., R.B. or G.L.)

Commenced drilling May 13, 1955; Completed June 14, 1955

The information given herewith is a complete and correct record of the well. The summary on this page is for the condition of the well at the above date.

Completed as oil well
(oil well, gas well, dry hole)

Signed Harold Milam

Title Division Production Superintendent

Date June 28, 1955

IMPORTANT ZONES OF POROSITY

(denote oil by O, gas by G, water by W; state formation if known)

From 5917.5 to 5927.5 (O) From ____ to ____
From ____ to ____ From ____ to ____
From ____ to ____ From ____ to ____
From ____ to ____ From ____ to ____

CASING RECORD

Size Casing	Weight Per Ft.	Grade	Thread	Casing Set	From	To	Sacks of Cement	Cut and Pulled from
9-5/8"	36#	J-55	8	1058.11'			400	
5-1/2"	15.50#	J-55	8	5932.50'			300	

TUBING RECORD

Size Tubing	Weight Per Ft.	Grade	Thread	Amount	Perforations
2-3/8"	4.60	J-55	8	5872.80'	open ended

COMPLETION RECORD

Rotary tools were used from 0 to 5937'
Cable tools were used from -- to --
Total depth 5937 ft.; Plugged back to 5928 T.D.; Open hole from ____ to ____

PERFORATIONS			ACIDIZED, SHOT, SAND FRACED, CEMENTED			
Interval From	Interval To	Number and Size and Type	Interval From	Interval To	Amount of Material Used	Pressure
5917.5'	5927.5'	1/2" jet	5917.5'	5927.5'	200 gallons acid	2000#

(If P&A show plugs above)

INITIAL PRODUCTION

Well is producing from Madison (pool) formation.

P. 196 barrels of oil per 24 hours flowing
(pumping or flowing)

Negligible Mcf of gas per -- hours.

10 barrels of water per 24 hours, or ____ % W.C.

(OVER)

M—5-55

good form

INITIAL PRODUCTION—(Continued)

Initial 10-day average production 108.40 (bbl./day) (if taken)
Pressures (if measured): Tubing 150 psi flowing; 850 psi shut-in
Casing 175 psi flowing; 875 psi shut-in
Gravity 40.4 ° API (corrected to 60° F.)

DRILL STEM TESTS

D.S.T. No.	From	To	Tool Open (Min.)	Shut-In	F.P.	S.I.P.	Recovery	Cushion
1	5641	5655	180	20	130	2450	30' salt water, slight show of oil, 270' salt water	
2	5785	5800	240	20	1552	2745	3400' salt water	
3	5772	5782	240	30	54	610	180' slightly oil-cut mud	
4	5924	5937	160	30	2248	3018	6410' clean oil, 500' oil-gas-cut mud, 210' salt water	

LOGS RUN

Type	Intervals From	Intervals To
Schlumberger Electrical Log 2"	1057'	5931'
Schlumberger Electrical Log 5"	2000'	5931'
Schlumberger Microlog 5"	2000'	5929'
Schlumberger Microlog 25"	5400'	5929'

FORMATION RECORD

From	To	SAMPLE AND CORE NO. AND DESCRIPTION	Top of Formation
		SEE ATTACHED SHEETS	

Form 9-330

Budget Bureau No. 42-R-355.3.
Approval expires 12-31-55.

U. S. LAND OFFICE Billings
SERIAL NUMBER BLM-A 012245
LEASE OR PERMIT TO PROSPECT

45

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

LOCATE WELL CORRECTLY

Company MURPHY CORPORATION Address B-13 Behner Bldg, Billings, Montana
Lessor or Tract ~~E.P.C.~~ Phillips Pet. Co. (BLM-A 012245) Field East Poplar State Montana
Well No. 55 Sec. 23 T. 28N R. 51E Meridian M.P.M. County Roosevelt
Location 1980 ft. {N.} of S Line and 660 ft. {E.} of W Line of Section 23 Elevation 2230' K.B.
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed Harold Milam

Date June 28, 1955 Title Division Production Supt.

The summary on this page is for the condition of the well at above date.

Commenced drilling May 13, 19 55 Finished drilling June 14, 19 55

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from 5917.5 to 5927.5 No. 4, from to
No. 2, from to No. 5, from to
No. 3, from to No. 6, from to

IMPORTANT WATER SANDS

No. 1, from to No. 3, from to
No. 2, from to No. 4, from to

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
9-5/8"	36#	8	American	1046.86	Howco				Surface
5-1/2"	15.5#	8	American	5922.60 ft	Howco		5917.5	5927.5	Oil String

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
9-5/8"	1058.11'	400	Pump & Plug		
5-1/2"	5932.50'	300	Pump & Plug		

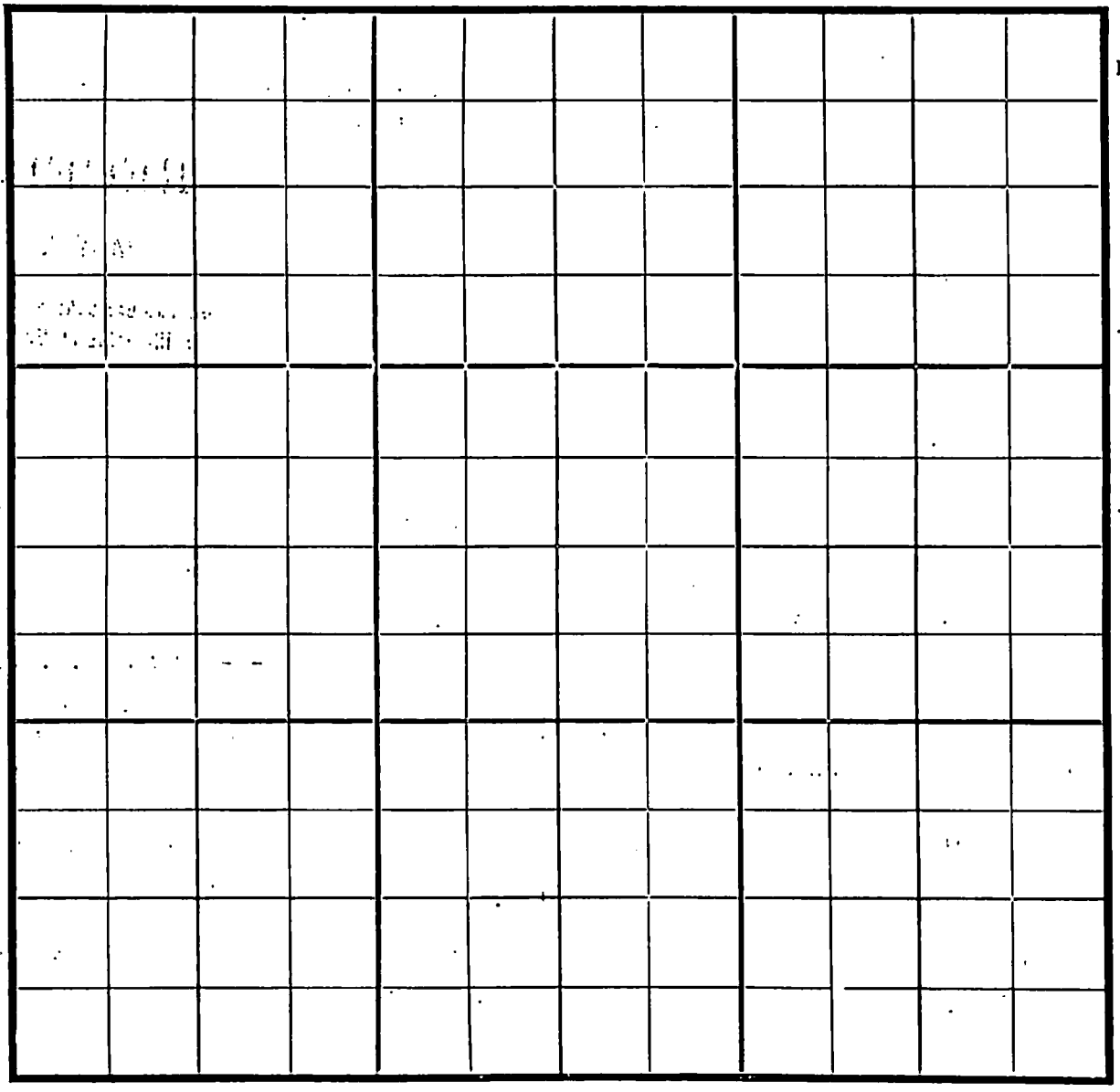
PLUGS AND ADAPTERS

Heaving plug—Material Length Depth set
Size

OLD | MARK

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

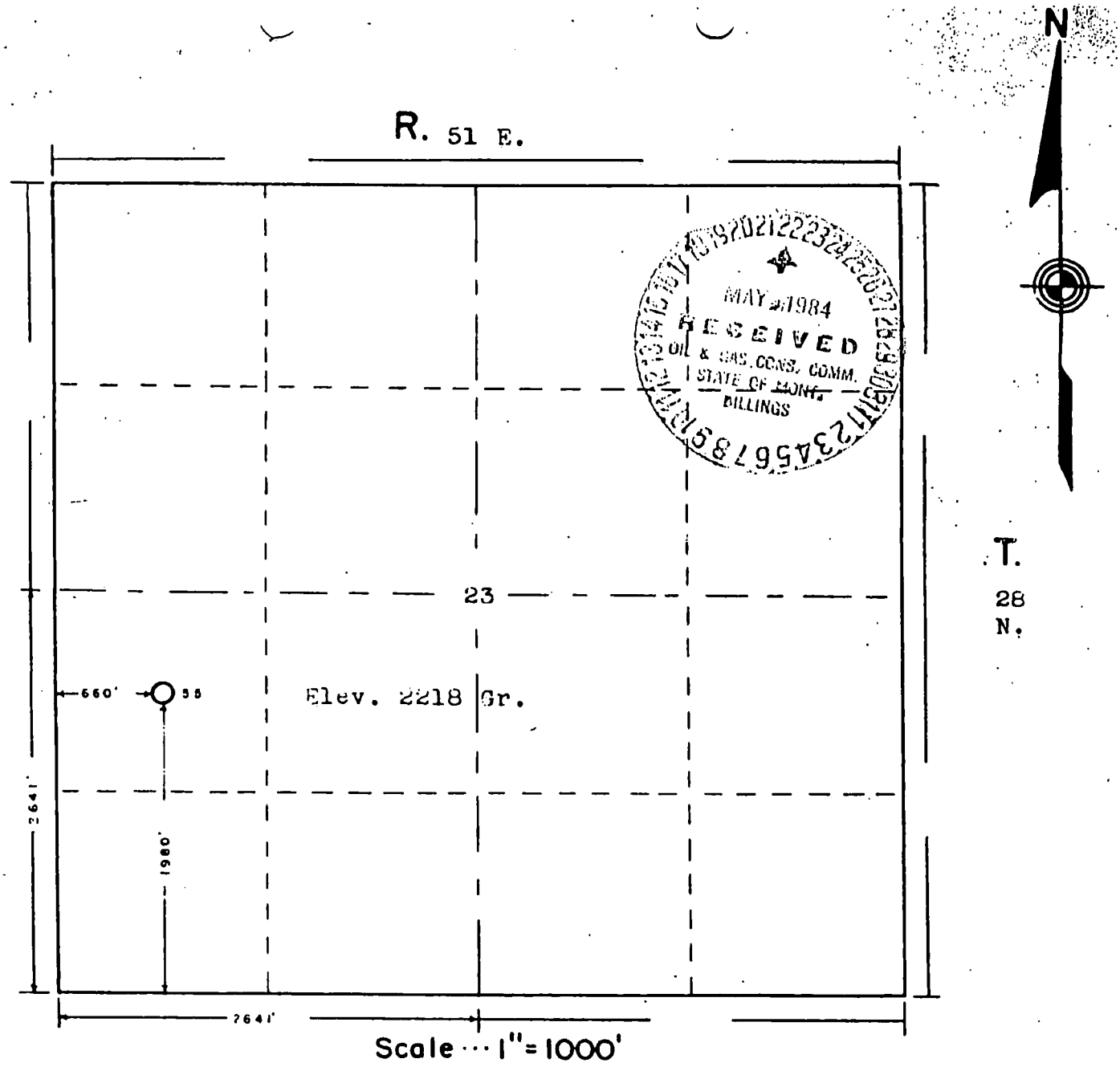


Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well, shall secure from the commission a drilling permit and shall pay to the commission therefor the following amounts: for each well whose estimated depth is thirty-five hundred (3500) feet or less; twenty-five dollars ($25.00); from thirty-five hundred and one (3501) feet to seven thousand (7000) feet, seventy-five dollars ($75.00); seven thousand (7000) feet and deeper, one hundred fifty dollars ($150.00).
2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Oil and Gas Conservation Commission of the State of Montana.
3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.
4. Surface or conductor casing must be properly cemented by an approved method to act as a tie in case an unexpected flow of oil, gas, or water should be encountered, unless special permission has been granted for formation shut-off.
5. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc., must be presented on Sundry Notices and Report of Wells form for approval by agent prior to commencement of work.
6. All substantial showings of oil or gas must be tested for commercial possibilities before drilling ahead. Each such showing must be adequately protected by casing, mud or cement, as drilling progresses.
7. The production string must be cemented unless a formation shut-off or packer is approved by the agent. Sufficient cement must be used to protect the casing and possible productive formation exposed in the process of drilling not otherwise protected.
8. All production strings of casing must be tested by bailing or pressure to determine if there is a tight bond with the formation or possible leaks in the casing. The results of the test must be reported on Sundry Notices and Report of Wells form, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.
9. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination when an agent visits the well.
10. All producing wells must be marked with name of the operator, number of the well, and location, using reasonable precautions to preserve these markings at all times.
11. Copies of all directional surveys, electrical logs, or tops from electrical log if electric survey is run, formation tests, and cementing record, as furnished by the cementing company, etc., must be filed with the State agent of the district together with four copies of the log, upon completion of the well.
12. All work must be done in conformity with the regulations of the Oil & Gas Conservation Commission of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.



Scale ··· 1" = 1000'

Powers Elevation Company of Casper, Wyoming has in accordance with a request from Harold Milam for Murphy Corp. determined the Location of #55 East Poplar Unit to be C-NW SW Section 23 Township 28 N. Range 51 E., Montana Principal Meridian Roosevelt County, Mont.

The above Plat shows the location of the well site in said section.

Powers Elevation Company
by: Donell T. White
Registered Land Surveyor

Date: 5/11/55

COMPLETION DATA

CASING: Ran 33 jts. 1046.83' of 9-5/8", 36#, J-55, R-2, 8rd. thd., American casing. Landed 11.25' below RKB and set at 1058.11'. Cemented with 400 sacks of regular cement with 2 percent $CaCl_2$. Plug down at 12:40 A.M., 5-15-55. Bumped plug with 1000#, released pressure, float held ok. Circulated approximately 50 sacks of clean cement.

Ran 187 jts. 5922.60' of 5-1/2", 15.50#, J-55, 8rd. thd., R-2, American casing. Landed 9.90' below RKB. Howco fillup shoe at 5932.50', baffle collar at 5897.25'. 145' of Howco roto-wall scratchers at 5636'-5671', 5770'-5931'; 5 Howco centralizers at 5620', 5710', 5840', 5880', and 5920'. Cemented with 300 sacks Ideal bulk cement with 2 percent gel. Bumped plug with 1000#, float would not hold. Pipe rotated freely throughout cementing. Plug down at 1:12 P.M., 6-3-55.

COMPLETION: Ran 2-3/8" tubing, drilled baffle collar and cement to 5930'. Spaced 2-3/8" tubing to 5872.70'. Displaced mud with water and water with oil.

Perforated "C" Zone 5920'-5925' with 5 jets per foot using Lane Wells 1-3/4" gun. Tested in test tank; flow rate, open flow 68 BOPD, no water. Circulated clean oil out of tubing, no water. Pumped clean oil in formation at rate of 8 gallons per minute at 2500# pressure. Tested for 12 hours, flow rate, open flow 86 BOPD, no water, TFP--0, CP--25#. Treated with 500 gallons Howco M.C.A. at 1900# maximum pressure. Injection rate 2 BPM at 1400# pressure. Flowed M.C.A. to surface in 10 minutes, 85% salt water followed M.C.A. and increased to 92%, chlorides 34,000 PPM, conditioned mud 10.4 to kill well.

Ran Howco type "C" production packer and set at 5895'. Displaced mud with water and water with oil. Broke formation with oil at 1400# pressure. DOC squeezed with 100 sacks Slo-set cement, maximum pressure 4400#, held with 30 sacks in formation, reversed out 70 sacks. Job complete at 7:00 P.M., 6-8-55.

6-9-55, Stung tubing back into packer and swabbed approximately 15 barrels of displacement oil. Swabbing machine broke down. Attempted to run Lane Wells 1-3/4" tubing gun but it stopped at 5400' apparently on DOC slurry. Circulated out oil. Went in hole with 1-3/4" tubing gun, would not go to bottom through tubing. Drilled out packer to 5928'. Perforated "C" Zone 5920'-5927.5' with 40 bullets using Lane Wells 4" gun. Ran tubing. Displaced mud with water and water with oil. Flowed small stream the size of a pencil. Swabbed 57 barrels of displacement oil showing a small amount of gas while pulling swab, no water. Swabbed down to 5000', let set 1 hour, no fluid rise. Loaded hole with oil. Pressured up with 3200#, pressure held for 30 minutes, formation would not take fluid.

Reperforated "C" Zone 5917.5'-5927.5' with Lane Wells 1-3/4" tubing gun through tubing with 5 jets per foot. Pressured up to 3300#, formation would not take fluid. Acidized with 250 gallons Dowell regular 15% acid, maximum pressure 2000#. Injected 1/2 barrel of acid in formation after soaking for 90 minutes, no formation break. Flowed unspent acid to surface in 115 minutes, flowed acid and cut oil for 30 minutes. Reversed out tubing to clean. Flowed at the rate of 206 barrels fluid per day with an average water cut of 5%, TFP--150#, CFP--175# on a 1/4" choke, CSIP--875#, TSIP--850# (initial potential).

Rig released at 6:00 A.M., 6-14-55.

Tubing record--

190 joints	5902.63'
3 subs	14.00'
Landed below RKB	8.48'
Bottom of tubing	5925.11'

RECEIVED
JUN 30 1955
OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA - BILLINGS

COMPLETION DATA

CASING: Ran 33 jts. 1046.86' of 9-5/8" 36#, J-55, R-2, 8rd. thd. American casing. Landed 11.25' below RKB and set at 1058.11'. Cemented with 400 sacks of regular cement with 2 percent $CaCl_2$. Plug down at 12:40 A.M., 5-15-55. Bumped plug with 1000#. Released pressure. Float held OK. Circulated approximately 50 sacks of clean cement.

Ran 187 jts. 5922.60' of 5-1/2", 15.50#, J-55, 8rd. thd., R-2 American casing, landed 9.90' below RKB. Howco fill-up shoe at 5932.50', baffle collar at 5897.25'. 145' of Howco Roto-Wall scratchers at 5636 to 5671, 5770 to 5931; 5 Howco centralizers at 5620, 5710, 5840, 5880, and 5920. Cemented with 300 sacks Ideal bulk cement with 2 percent gel. Bumped plug with 1000#. Float would not hold. Pipe rotated free throughout cementing. Plug down at 1:12 P.M., 6-3-55.

COMPLETION: Ran 2 3/8" tubing to 5872.80'. Displaced mud with water, water with oil. Perforated "C" Zone 5920' to 5925'. 5 jet per foot with Lane Wells 1 3/4" gun. Ran through tubing 30 minutes. TSIP 300 pounds, CP 300 pounds. Open to pit 4 hours. Flow decreased to small stream, tested in test tank, flow rate open flow 68 BOPD, no water, circulated clean oil out of tubing, no water. Pumped clean oil in formation 8 gallons per minute at 2500 pounds pressure. Tested 12 hours open flow, flow rate 86 BOPD, no water. TFP 0, CP 25. Last 2 hour test before MCA treatment flow rate 80 BOPD, no water. TFP 0 pounds, CP 25 pounds. Treated with 500 gallons Howco MCA, 1900 pounds maximum pressure. Injection rate 2 BPM 1400 pounds min. pressure. Flowed MCA to surface, 10 minutes. 85 percent salt water. Followed MCA increased to 92 percent. Chlorides 34,000 PPM. Conditioned mud 10.4 to kill well. Ran Howco type C producing packer set at 5895'. Would not set lower, displaced mud with water, water with oil, broke formation with oil 1400 pounds pressure DOC squeezed with 100 sacks slo-set cement. Maximum pressure 4400 pounds. Held 30 sacks in formation, reversed out 70 sacks. Job complete 7:00 P.M., 6-8-55. Stung back into packer and swabbed approximately 15 bbls. of displacement oil. Swabbing machine broke down. Attempted to run Lane Wells 1 3/4" tubing gun, it stopped at 5400'. Apparently on DOC slurry. Circulated out oil and DOC slurry. Went in hole with 1 3/4" tubing gun. Would not go to bottom through tubing. Drilled out packer to 5928'. Perforated C Zone 5920' to 5927.5' with 40 bullets with Lane Wells 4" gun. Swabbed. Ran tubing. Displaced mud with water, water with oil. Flowed small stream size of pencil. Swabbed 57 bbls. of displacement oil showing small amount of gas while pulling swab. No water. Swabbed down to 5000'. Set 1 hour, no fluid rise. Loaded hole with oil. Pressured up with 3200 pounds. Pressure held for 30 minutes formation would not take fluid. Re-perforated C Zone 5917.5 to 5927.5' with Lane Wells 1 3/4" gun through tubing with 5 jts. per foot. Pressured up to 3300 pounds. Formation would not take fluid. Acidized C 5917.5' to 5927.5' with 250 gallons.

Dowel regular 15 percent acid, maximum pressure 2000 pounds. Injected 1/2 bbl. acid in formation after soaking 90 minutes. No formation break. Flowed unspent acid to surface 115 minutes. Flowed acid and cut oil 30 minutes. Reversed out tubing to clean. Flowed at the rate of 206 bbls. of fluid in 24 hours with an average water cut of 5 percent with 150 pounds TFP and 175 pounds CFP on a 1/4" choke. CSIP 875 pounds, TSIP 850 pounds.

E L E C T R O L O G D A T A

TYPE OF LOG	INTERVAL LOGGED
Schlumberger Electrical Survey 2"	1057'-5931'
Schlumberger Electrical Survey 5"	2000'-5931'
Schlumberger Microlog 5"	2000'-5929'
Schlumberger Microlog 25"	5400'-5929'

LOG TOPS

Eagle	1257	(+ 973)
Niobrara	2133	(+ 97)
Greenhorn	2474	(- 244)
Graneros	2687	(- 457)
Muddy Sandstone	3050	(- 820)
Dakota Silt	3264	(-1034)
Swift	3773	(-1543)
Vanguard	4052	(-1822)
Rierdon	4236	(-2006)
Piper Shale	4422	(-2192)
Piper Limestone	4494	(-2264)
Gypsum Springs	4553	(-2323)
Spearfish	4758	(-2528)
Amsden	4864	(-2634)
Heath	4994	(-2764)
Otter	5149	(-2919)
Kibbey Sandstone	5287	(-3057)
Kibbey Limestone	5445	(-3215)
Madison	5533	(-3303)

ELECTRO LOG DATA

TYPE OF LOG	INTERVAL LOGGED
Schlumberger Electrical Survey 2"	1057'-5931'
Schlumberger Electrical Survey 5"	2000'-5931'
Schlumberger Microlog 5"	2000'-5929'
Schlumberger Microlog 25"	5400'-5929'

LOG TOPS

	Depth	Datum	Thickness
Eagle	1257	+ 973	
Niobrara	2133	+ 97	
Greenhorn	2474	- 244	
Graneros	2687	- 457	
Muddy Sd	3050	- 820	
Dakota Silt	3264	-1034	
Swift	3773	-1543	
Vanguard	4052	-1822	
Rierdon	4236	-2006	
Piper Sh	4422	-2192	
Piper Ls	4494	-2264	
Gypsum Sprgs	4553	-2323	
Spearfish	4758	-2528	
Amsden	4857	-2627	
Heath	4994	-2764	
Otter	5149	-2919	
Kibbey Sd	5287	-3057	
Kibbey Ls	5445	-3215	
Madison	5533	-3303	
A-1	5622	-3392	3'
A-2	5630	-3400	2'
A-3	5640	-3410	8'
A-4	5647	-3417	28'
B-1	5780	-3550	9'
B-2	5796	-3566	18'
B-3	5820	-3590	5'
B-4	5850	-3620	4'
B-5	5885	-3655	?
C-1	5924	-3694	?
C-2	----	-----	----

DRILL STEM TESTS

D.S.T. #1: 5641'-5655' straddle packers 1/2" choke, no WC, tool open 3 hours, closed 20 minutes, tool open with weak blow, died in 1 hour and 40 minutes, recovered 30' salt water, very slight show oil; 270' salt water. IBHFP--15#; FBHFP--130#; BHSIP--2450#; Hydro--3090#. Bottom packer held.

D.S.T. #2: "B-2" Zone, 5785-5800', single packer 1/2" bottom choke, no WC, tool open 4 hours, closed 20 minutes, tool opened with good blow continued throughout test. Recovered 3400' salt water. IBHFP--15#; FBHFP--1552#; BHSIP--2745#; Hydro--3140#; Conditioned hole.

D.S.T. #3: "B-1" Zone, 5772'-5782', straddle packers 1/2" bottom choke, no WC. Tool open 4 hours, closed 30 minutes, tool open with weak blow for 150 minutes, dead rest of test. Recovered 180' slightly oil cut mud, no free water, IBHFP--15#; FBHFP--54#; BHSIP--610#; Hydro--3130#.

D.S.T. #4: 5924-5937, 1/2" bottom choke, no WC. Tool open 160 minutes, closed 30 minutes, gas to surface 45 minutes, oil and gas cut mud 145 minutes, flowed oil and gas cut mud 10 minutes. Clean oil 5 minutes. Recovered 5410' clean oil, 500' oil and gas cut mud, 210' salt water. IBHFP--100#; FBHFP--2248#; BHSIP--3018#; Hydro--3385#.

CORE ANALYSIS REPORTS

Company MURPHY CORPORATION Date May 30, 1955 Lab. No. 376 Well No. Unit #55 Location C NW SW 23-28N-51E

Formation "B" Zone Field East Poplar County ROOSEVELT State Montana Depths 5770-5800

Sample No.	Representative of Feet	Midpoint of Sample	Permeability		Effective Porosity	Density		Saturation % of Pore Space	
			Radial	Vertical	Percent	Bulk	Matrix	Resid. Oil	Water
	Core #2	5770-5800	Rec.33'						
NS	5770-76								
1	76-77		1.01	0.10	7.0	2.53	2.72	Tr	23.3
2	77-78		5.36	2.15	9.0	2.46	2.71	9.7	63.3
3	78-79		1830	9.87	15.3	2.34	2.77	8.5	51.1
4	79-80		0.63	0.03	6.3	2.55	2.73	0.0	15.9
5	80-81		12	0.14	5.5	2.57	2.72	Tr	58.9
6	81-82		4.99	1.91	10.4	2.41	2.69	14.9	22.9
7	82-83		8.36	4.36	17.7	2.22	2.70	12.8	36.3
8	83-84		6.47	1.17	11.6	2.36	2.67	10.0	80.6
9	84-85		4.48	2.60	13.1	2.38	2.74	7.9	57.9
NS	85-94								
10	94-95		14	7.45	10.9	2.40	2.70	6.0	32.1
11	95-96		17	8.78	11.1	2.38	2.68	6.6	40.6
12	96-97		5.01	3.63	16.4	2.23	2.67	12.9	47.7
13	97-98		2.93	0.62	10.1	2.39	2.66	9.6	49.5
14	98-99		8.13	7.75	16.6	2.23	2.67	15.1	33.1
15	99-5800		6.28	5.57	6.8	2.52	2.71	5.1	64.7
16	5800-01		18	1.80	8.2	2.50	2.72	6.0	50.1
17	01-02		3.44	2.74	8.5	2.47	2.70	13.3	59.8
NS	02-03								

CORE DESCRIPTION

Core No. 1, 5650 - 5673, recovered 12' (?)

1'	Limestone, gray-brown, micro to cryptocrystalline, hard, with numerous short tite to fairly tite vertical and horizontal fract, bleeding oil, good oil odor, fluorescence and stain.
5'	Limestone: dark brownish-gray, micro to cryptocrystalline, dense, hard, with shaley bands in middle 2', No Show.
1'	Limestone, medium brown, cryptocrystalline, dense, with several tite irregular fractures with some bleeding oil associated, stylolitic parting along bottom. Fair oil odor on fresh break, spotty fluorescence except along fractures.
3'	Limestone: brown-gray, micro to medium crystalline, some pin point porosity, broken and fractured removing (?) from core barrel, slight oil odor on fresh break, weak spotty fluorescence and cut, bottom foot has several tite, irregular fractures with some bleeding oil.
2'	(?) Limestone, brown-gray to black, microcrystalline to fine crystalline, earthy appearance, ground up and fractured in core barrel. Unit appears wet, trace bleeding oil when removed from barrel.

Core No. 2, 5770 - 5800, recovered 33'

6'	Anhydrite, gray, massive, No Show.
9'	Limestone: medium gray-brown, micro to cryptocrystalline, somewhat brittle with numerous tite hairline fractures scattered thruout, slight visible porosity, some thin dense zones, fair to good oil odor on fresh break, spotty to even yellow fluorescence throughout unit, staining readily apparent along fractures and on fresh break. Unit has questionable wet look.
9'	Anhydrite, gray, massive, medium hard, No Show.
8'	Limestone, dark brown-gray, fine crystalline, slight visible porosity, some vuggy effect on outside, possible salt leaching, good oil odor on fresh break, fair staining and golden-yellow fluorescence along fresh break. (Salt frosting 1', 5' from top).
1'	Limestone, brown-gray, earthy to shaley, soft and crumbly, trace odor, stain and fluorescence.

Core No. 3, 5920 - 5937, recovered 13'

1'	Limestone: dark gray, amorphous-microcrystalline, very hard, argillaceous, dense, single tight diagonal fractures in bottom 3". No Show.
1'	Limestone: as above with several fairly well developed,

fairly tight, fractures with faint oil odor and stain along fracture planes, spotty dull golden yellow fluorescence.

1' Dolomite: light gray, fine crystalline, dense with numerous thin streaks of porosity; good oil odor and stain in porous streaks; spotty dull golden yellow fluorescence.

3' Limestone: dark gray, amorphous to microcrystalline, dense except for numerous well developed diagonal fractures, selenite crystals developed along some of the fracture planes; faint oil odor with no stain along fracture planes; spotted dull yellow fluorescence.

1'6" Anhydrite, gray-brown, amorphous to microcrystalline, very dense, No Show.

6" Dolomite; medium gray, microcrystalline, dense except for single thin porous streak near top of unit with faint oil odor and stain in porous streak, spotty golden yellow fluorescence.

3'6" Limestone: dark gray, amorphous, dense, very highly broken and fractured, some selenite crystals along fracture planes, very faint oil odor along some fracture planes, no visible stain, faint, spotty golden-yellow fluorescence along some fracture planes; (fractures appear to be flushed by drilling mud).

1'6" Limestone: dark brownish-gray, fine to medium crystalline, very slightly porous, very highly fractured in bottom 1', good oil odor and stain in matrix, with spotty to fairly even golden yellow fluorescence, faint oil odor and stain along fracture planes, spotty golden-yellow fluorescence.

MUD PROGRAM SUMMARY

MUD ADDITIVES USED:

Aquagel	103 sacks	Hydroton	170 sacks
Barofos	3 sacks	Smentox	2 sacks
Baroid	310 sacks	Soda Ash	15 sacks
Driscose	15 sacks	Tannex	25 sacks

Mud Cost	$4,237.68
Drayage	190.05
Total Mud Cost	$4,427.73

SUMMARY:

Drilled surface hole to 1084' and ran 33 joints (1046.86') of 9 5/8" casing set at 1058.11' and cemented with 400 sacks of regular cement with 2% cacl2.

Drilled out from under surface pipe to approximately 4285' with water where a tannex-hydroton mud program was started and maintained to a total depth of 5937' with additions of aquagel, hydroton, soda ash, tannex, driscose and barcid. Ran 187 joints (5922.60') of 5 1/2" casing set at 5932.50 and cemented with 300 sacks of Ideal with 2% gel. Three cores and three drill stem tests were run and no difficulty was encountered while drilling.

Mud characteristics while drilling were as follows:

Depth	Weight	Viscosity	Water Loss	Ph
4370	10.0	35	9.0	10.5
4966	10.1	47	10.0	11.0
5247	10.3	47	11.0	11.0
5462	10.2	59	15.0	11.5
5650	10.2	53	14.0	11.5
5800	10.2	65	14.6	11.0
5931	10.3	48	14.0	11.0

D R I L L I N G B I T A N D T O T C O R E C O R D S

Bit No.	Make	Type	Ser. No.	Size	From	To	Totco Footage	Degrees
1	Sec.	OSC3	Re Run	12 1/4	0	1084	600	.0
2	Sec.	S3	85004	8 3/4	1084	3074	1552	1.
3	"	S6	92349	"	3074	3553	3074	1/2
4	"	"	92363	"	3553	3875		
5	"	"	92362	"	3875	4285		
6	"	"	92347	"	4285	Fishing		
7	"	"	92367	"	4285	4600		
8	"	"	93096	"	4600	4892		
9	"	M4N	77538	"	4892	5060	5066	1/2
10	"	"	77375	"	5060	5179		
11	"	"	77585	"	5179	5371		
12	"	"	75510	"	5371	5508		
13	"	"	77483	"	5508	5650		
14	"	"	77687	"	5650	5788		
15	"	"	77586	"	5788	5937		

* * * * * * * * *

Christenson Diamond Core Bit Record Bit No. D-713

Core No.	From	To	Footage
1	5650	5673	23
2	5770	5800	30
3	5920	5937	17 .

SAMPLE DESCRIPTIONS

2000	2320	Shale: medium gray, micaceous, sandy, fissile, sandstone, scattered, light gray to white, fine grain, bentonitic
2320	2400	Shale: light gray, silty Sandstone: as above
2400		Sample Top Greenhorn (?)
2400	2500	Shale: light gray, calcareous Limestone: medium gray, crystalline, dense Sandstone: scattered light gray, bentonitic
2500		Sample Top Graneros (?)
2500	2600	Shale: medium gray, calcareous Trace Pyrite and bentonite
2600	2700	Shale: medium to dark gray, calcareous with some white specks; trace pyrite and aragonite
2700	2990	Shale: dark gray, silty, very slightly calcareous; trace light gray siltstone
2990	3050	Shale: as above Trace sandstone: light gray, fine grain, micaceous
3050		Sample Top Muddy Sandstone
3050	3105	Sandstone: light gray, fine to medium grain, micaceous, slightly glauconitic; Shale as above
3105		Sample Top Skull Creek
3105	3395	Shale: medium to dark gray; fissile Sandstone: trace as above
3395	3655	Shale: as above, becoming silty Sandstone: scattered medium grain, gray
3655	3720	Shale: grays and browns, silty, trace variegated Sandstone: scattered, white, medium grain, porous
3720		Sample Top Swift
3720	3910	Shale: dark gray to black, to brown, splintery; trace red variegated shale Siltstone: brown, scattered Sandstone: fine grain, light gray, glauconitic, slightly calcareous

SAMPLE DESCRIPTIONS CONT'D.

3910	4057	Shale: predominantly brown, silty; some dark gray to black Sandstone: fine grain, light gray, glauconitic calcareous
4057		Sample Top Rierdon
4057	4203	Shale: brown and gray-green, some grays Sandstone: fine grain, scattered gray to gray-green, slightly calcareous
4203	4290	Shale: gray to dark gray, fissile, platy; some gray-green
4290	4327	Shale: gray-green, flakey, slightly calcareous; some grays and browns Sandstone: trace very fine grain to medium fine grain, dark gray, micaceous
4327	4390	Shale: gray-green as above Sandstone: as above Limestone: scattered, brown, fine crystalline, dense Shale: red
4390		Sample Top Piper Shale
4390	4471	Shale: gray to green-gray, splintery Trace soft silty red to orange shale Trace limestone, cream to brown micro-crystalline, dense
4471		Sample Top Piper Limestone
4471	4697	Limestone: medium light to chocolate brown, micro-crystalline, dense, hard Shale: as above Sandstone, trace, very fine grain, light gray, glauconitic
4697	4732	Sandstone: scattered light red, very fine grain, very slightly calcareous, anhydritic Shale: light gray Limestone: scattered, cream to brown, micro-crystalline
4732		Sample Top Spearfish
4732	4800	Sandstone: light red to pink, fine to very fine grain, anhydritic Shale: medium gray, splintery Shale: dark red to brown shale Anhydrite: scattered
4800	4858	Sandstone: as above 100%
4858		Sample Top Amsden
4858	4893	Dolomite: light gray and pink, fine crystalline, medium hard to dense

Shale: scattered, green-gray
Shale: gray
Pyrite: trace

4893 4927 Limestone, buff to light gray, micro-crystalline, dense, oolitic
Shale, trace, reds and grays
Some anhydrite

4927 4951 Shale: gray, splintery, some reds, greens and purples
Limestone: trace as above

4951 5014 Limestone: light brown, oolitic, crypto-crystalline, dense
Shale: same as above

5014 5057 Shale: variegated, reds, gray-greens, some purples, becoming silty
Limestone: trace, buff, crypto-crystalline

5057 Heath Porosity

5057 5087 Sandstone: coarse grain, clear to light gray-pink, turning to grape red with depth, No Show

5087 Sample Top Otter

5087 5184 Shale: reds, purples, some grays
Sandstone: scattered, as above
Limestone: brown-gray, trace

5184 5279 Shale: as above
Limestone: some light gray, micro-crystalline, soft
Trace anhydrite

5279 Kibbey Sandstone

5279 5307 Sandstone: light gray to pink, fine grain
Shale: reds, grays, gray-green and purples

5307 5382 Main 1st Kibbey sandstone coarse to medium grain, light gray to grape red, sandstone, No Show
Shale: as above, increasing with depth

5382 5442 Sandstone: fine grain, brick red, dense, No Show
Shale: scattered red and gray

5442 Kibbey Lime

5442 5460 Limestone, buff to cream with dark inclusions, dense
Shale: some grays, reds and browns

5460 5510 Sandstone: fine grain, brick red, dense
Limestone: trace as above
Shale: as above

5510		Sample Top Madison
5510	5550	Limestone: scattered, brown-gray, cryptocrystalline, dense Shale: reds, silty Anhydrite: massive crystalline to soft white
5550	5610	Limestone: brown-gray, microcrystalline dense Anhydrite, scattered, as above
5610	5650	Limestone: brown-gray, as above Shale: some grays and blacks Anhydrite, trace as above
5650	5673	Core No. 1 Recovered 12'
5673	5700	Limestone: dark brown-gray, oolitic (?) medium crystalline, No Show Shale: reds and browns, silty
5700	5770	Limestone: brown-gray, microcrystalline, dense Dolomite: scattered, light gray, fine crystalline, dense Shale: grays and reds, silty Anhydrite scattered at base of unit
5770	5800	Core No. 2 Recovered 33'
5800	5920	Limestone: brown-gray, microcrystalline, dense Dolomite: light gray, fine crystalline Anhydrite: scattered
5920	5937	Core No. 3 Recovered 13'

EXPLORATION PROSPECT FOR East Poplar Unit (Lease Name) — 55 (Well No.)

LOCATION NW SW Section 23-T28N-R51E FIELD East Poplar

COUNTY Roosevelt STATE Montana

ELEVATION 2220' K.B.(est) OBJECTIVE FORMATION AND DEPTH Madison "C" Zone 5970'

EXPECTED STRATIGRAPHIC SECTION AND ESTIMATED DEPTHS

Judith River	860 (+1360)	Amsden	4810 (-2590)
Eagle	1260 (+ 960)	Heath	4984 (-2764)
Niobrara	2120 (+ 100)	Otter	5137 (-2917)
Greenhorn	2470 (- 250)	Kibbey Sandstone	5292 (-3072)
Muddy Sandstone	3047 (- 827)	Kibbey Limestone	5430 (-3210)
Dakota Silt	3270 (-1050)	Madison	5530 (-3310)
Morrison (?)	3648 (-1428)	"A" Zone	5645 (-3425)
Piper Shale	4405 (-2185)	"B-1" Zone	5765 (-3545)
Piper Limestone	4480 (-2260)	"B-2" Zone	5783 (-3563)
Gypsum Springs	4535 (-2315)	"C" Zone Intercrystalline	5955 (-3735)
Spearfish	4730 (-2510)		

RECOMMENDED CORING PROGRAM

"A" Zone (25')
"B-1" and "B-2" Zones (35')
"C" Zone (35')

Circulate Out and Core on Show:
Heath Sands
First Kibbey Sand
Watch for show in Rierdon samples, but do not take core.

RECOMMENDED TESTING PROGRAM

"A" Zone
"B-1" and "B-2" Zones separately
"C" Zone
All other tests to be run at discretion of well site geologist.

RECOMMENDED LOGGING SERVICE

A. ELECTRIC LOG: (1) Surface ___ (2) Correlation ___ (3) Total Depth X

B. MICRO LOG: (1) Surface ___ (2) Correlation ___ (3) Total Depth X

C. GAMMA RAY: ___ D. LATERO LOG: ___ E. LIMESTONE: ___

F. OTHER: ___ VELOCITY SURVEY ___ MUD TRUCK ___

GENERAL INFORMATION (SURFACE AND NEAR SURFACE SEDIMENTS, DRILLING WATER, CULTURE, ACCESSIBILITY, NEARBY WELL CONTROL, ETC.)

Nearest subsurface control: E.P.U. #26, SW NE Section 23 -T28N-R51E. A questionable oil show was noted in the Rierdon formation in E.P.U. #22 at 4260. Also shows were noted in the Heath sand and Kibbey sandstone in this well. D.S.T. taken of the Heath on E.P.U. #22 was inconclusive.

TUBULAR PROGRAM
1000' of 9-5/8" O.D.
6000' of 5-1/2" O.D.

REMARKS:

Note off pattern location.

BILLINGS DIVISION

DATE May 9, 1955

BY Bill Lam

App'd. By bm
Date: 5-9-55

DRILLING PROSPECTUS FOR East Poplar Unit (Lease Name) 55 (Well No.)

LOCATION NW SW Section 23-T28N-R51E FIELD East Poplar

COUNTY Roosevelt STATE Montana

SURFACE HOLE

SIZE:	12-1/4"
MUD:	Natural and chemical
CASING:	9-5/8" O.D. J-55
CEMENT:	400 sacks regular 2% $CaCl_2$
SETTING TIME:	24 hours

BELOW SURFACE

HOLE SIZE:	8-3/4"
CORE HOLE SIZE:	7-7/8"
TEST TOOLS:	Howco
TESTING TIME:	4 hours
SHUT IN TIME:	20 to 30 minutes
CASING:	6000' of 5-1/2" O.D. J-55, ST&C
CEMENT:	300 sacks Slo-set 2% gel

MUD PROGRAM

TYPE:	Natural and chemical to 4000'. Caustic & quebracho from 4000' to TD
MUD WEIGHT:	10.4 to 10.6
WATER LOSS:	15 cc or less
PH:	12
VISCOSITY:	40

NOTES:

Completion program to be determined later.

BILLINGS DIVISION

Date 5-5-55

By Harold Milam

PRINTED IN U. S. A.
103 3-25 12500 6-54

EPU #55

File

DOWELL INCORPORATED

STAGE NO.

TREATMENT NO.

TREATMENT REPORT

DISTRICT #15 STATION Williston, N. Dak DATE 6-13, 1955

OWNER Murphy Corp. LEASE E.P.U. WELL NO. 55

POOL East Poplar COUNTY Roosevelt STATE Montana

LOCATION Sec — OWNER'S REPRESENTATIVE M. T. James

WELL DATA

FORMATION "C" Zone

PAY-FROM 6717.5 TO 6727.5

PRESENT TOTAL DEPTH 6728 P. B. FROM 5761

PIPE DATA—

CASING SIZE 5½" WT. 15.5#

CASING DEPTH 6732.5 SKS. CEMENT 300

LINER SIZE — WT. —

LINER DEPTH-FROM — TO —

LINER DESCRIPTION —

TUBING SIZE 2" EUE DEPTH 5915

PACKER-TYPE — DEPTH —

PACKER FURNISHED BY OPERATOR — DOWELL —

COMPLETION DATA—

DATE Now CABLE TOOL —

ROTARY yes DRILLING FLUID Mud

SIZE OPEN HOLE —

PERFORATING DATA OR PAY ZONES

SHOTS/FT.	FROM	TO
4	6717.5	6727.5

PRODUCTION—

	OIL	WATER	G. O. R.
INITIAL			
PRESENT			

ACIDIZING. SHOOTING AND LOGGING RECORD—

DETAILED RECORD OF TREATMENT

TIME A.M. or (P.M.)	PRESSURE CASING	PRESSURE TUBING	BBLS. OF ACID OUT OF TANKS	BBLS. OF ACID IN FORMATION	BBLS. OF ACID PER READING	BBLS. OF ACID PER MINUTE	REMARKS
12:20	CST	—					ARRIVAL AT LOCATION WITH 1000 GALS. OF DOWELL XF
1:32	—	—					Start Bleeding 66½ Acid down Tubing — FILL 0 BBLS.
1:38	—	—					Start 186½ oil Topped Acid over Formation — BLEED 24 BBLS.
1:49	600	600					Acid spotted. Set 5 minutes — FLUSH 6 BBLS.
1:54	900	1000					Pressure To 1000# Let Set
1:59	900	1000					Bled by, 2 - 66½ P. i To 1000#
2:02	1500	1500	24½	0	—	—	
2:07	1500	1500					Bled by 20-66½ P.S.i To 2000#
2:09	9000	2000	24½	.25	.20	.25	Let Set 5 minutes
2:10							Fix Leaks on Tanks
2:30	1250	1350					Resume Pumping
2:33		1750	24½	.5	.25	.25	Pumping - Shut down
							Let well Flow back.
5:10							Start circulating down casing
5:24							well circulated
6:15	850	850					Shut in Pressure
7:30	CST	—					LEFT LOCATION Trucks

IF TREATMENT IS NOT CONVENTIONAL LIMESTONE FORMATION TREATMENT TO INCREASE OIL OR GAS PRODUCTION, STATE PURPOSE OF TREATMENT.

B. Owen
SERVICE ENGINEER

STATION COPY.

STATION OR DISTRICT MANAGER

YAPUNCICH, SANDERSON & BROWN LABORATORIES

P. O. BOX 593 — BILLINGS, MONTANA — 20 N 31st St.

WATER ANALYSIS REPORT

Lab. No. _____

Field East Poplar — County Roosevelt — State Montana
Well No. 55 Unit — Location C NW SW 23-28N-51E
Formation "C" Zone (Charles) — Depths 5923-5937'
Operator Murphy Corporation — Date Sampled 6-2-55
DST No. 4 Sample — Date Analyzed 6-21-55
Other Data Tool open 2 hrs. and 40 min. SI 30 min. Oil to surface in 2 hrs., 40 min. Recovered 5410' clean oil, 500' oil cut mud, 210' salt water. FP 200-2248 lbs., SIP 3018 lbs., HP 3385 lbs. Sample clear amber colored water with small amount of mud on bottom. Precipitates on exposure to air.

Constituents	PPM	MEQ.	MEQ. %
Sodium	23,598	1026.46	47.45
Calcium	893	44.56	2.06
Magnesium	128	10.52	0.49
Sulfate	2016	41.93	1.94
Chloride	36,540	1030.43	47.64
Carbonate	0	0	0
Bicarbonate	560	9.18	0.42

Total Solids in Parts per Million
By evaporation 64,560
After ignition 62,600
Calculated 63,451

pH 6.5

Specific Gravity @ 60°F 1.045

Resistivity @ 68°F
ohms/meter³ 0.13

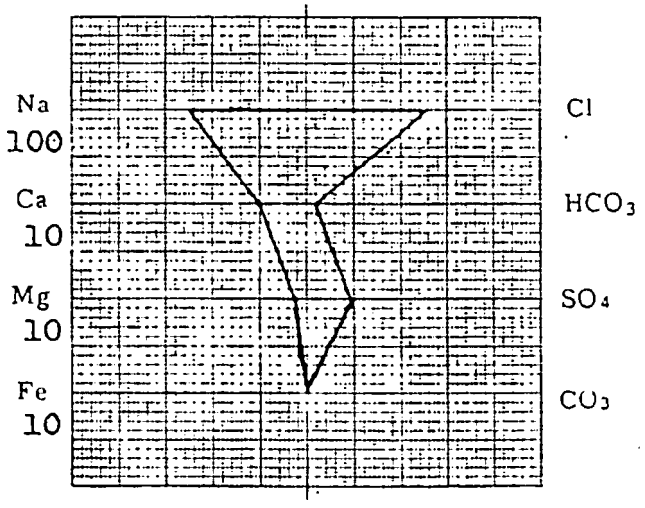
Chloride as NaCl 60,254 PPM.

Total Solids From Resistivity as NaCl 62,401 PPM.

NOTE: Sodium and potassium reported as sodium. MEQ. = milliequivalents per liter. PPM = parts per million (milligrams per liter). 1 PPM equivalent to 0.0001%.

WATER ANALYSIS PATTERN

Scale MEQ. Per Unit



SPECIALIZING IN CORE, WATER, GAS AND CRUDE OIL ANALYSES

WESTERN LITHO-PRINT, INC., BILLINGS, MONT.

Location: C NW SW Sec. 23-T28N-R51E
Spacing - 160 acres
Elevation: 2230 K.B. - 2218 Gr.
Spudded: 5-13-55
Completed: 6-14-55
T.D.: 5937' Drlr - 5933' Schl.
Prod. Zones: C (5920-5927')

Schlumberger Tops

	Depth	Datum	Thickness
Judith River	----	-----	---
Greenhorn	2474	- 244	
Muddy Sd	3050	- 820	
Dakota Silt	3264	-1034	
Piper Ls	4494	-2264	
Amsden	4864	-2634	
Heath	4994	-2764	
Otter	5149	-2919	
Kibbey Sd	5287	-3057	
Kibbey Ls	5445	-3215	
Madison	5533	-3303	
A-1	**5622	-3392	3'
A-2	**5630	-3400	2'
A-3	**5640	-3410	8'
A-4	*5647	-3417	28'
B-1	*5780	-3550	9'
B-2	*5796	-3566	18'
B-3	5820	-3590	5'
B-4	**5850	-3620	4'
B-5	5885	-3655	?
C-1	5924	-3694	?
C-2	----	-----	---

**Probable prod. Zones (from DST Structural position, etc.
*Shows

Drill Pipe Corrections (Made)
None

Coring Intervals:
#1 5650-5673 Rec. 12' A-4
#2 5770-5800 Rec. 33' B-1 & 2
#3 5920-5937 Rec. 13' C-1

Drill Stem Tests:
DST #1 5641-55' A-4. Strad. Op 3 hrs. SI 20 min. Opn w/ weak blow, died in 1 hr. 40 min. Rec. 30' s.w. very sli. show of oil, 270' s.w. IBHFP 15, FBHFP 130 BHSIP 2450, Hydro 3090.
DST #2 5785-5800 B-2 Single pkr. Tool opn 4 hrs, SI 20 min. Opn w/good blow, cont. thruout test. Rec. 3400' s.w. IBHFP 15, FBHFP 1552, BHSIP 2745, Hydrl 3140.
DST #3 5772-82' B-1, Strad. test. Tool opn 4 hrs. SI 30 min. Opn w/w. blow for 150 min, dead rest test. Rec. 180' sli oil cut mud. no free wtr. IBHFP 15, FBHFP 54 BHSIP 610 Hydro 3130.
DST #4 5924-37' C-1. Tool opn 160 min. SI 30 min. Gas to surf. 45 min, o & g cut mud 145 min, flwd o & g cut mud 10 min. Cln oil 5 min. Rec. 5410' cln oil, 500' o & g cut mud, 210 s.w. IBHFP 100, FBHFP 2248, BHSIP 3018, Hydro 3385.

History Subsequent to Completion:
None